

Nasal Layer Lengthening in Cleft Palate Repair Outcome of Two Techniques.

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ABSTRACT:

BACKGROUND:

Cleft palate repair aims at producing closure of the cleft with reasonably lengthy palate in order to have competent velopharyngeal closure. Various procedures have been described and used for this purpose. Primary lengthening of the nasal layer is one of these procedures.

OBJECTIVE:

The aim of this study is to evaluate two procedures of primary nasal layer lengthening, with or without a turned in buccal flap.

METHODS:

The total number of our patients is 36. Twelve patients of our study did not undergo nasal layer lengthening technique and considered as control (group A). Twenty four patients underwent lengthening of nasal layer technique.

In 12 of them (group B) the raw area of nasal layer was covered only by oral layer flaps and 12 cases of them (group C) the raw area of nasal layer was covered by unilateral buccal flap.

RESULT:

All patients who had this technique (group B&C) obtained an acceptable lengthening of the palate and it approached the posterior pharyngeal wall. Three patients to whom we used nasal layer lengthening technique without buccal flap developed complications; two fistulas and one case of infection, while patients with nasal layer lengthening with buccal flap and patient without nasal layer lengthening technique showed lower level of complications.

CONCLUSION:

Nasal layer lengthening technique is a favorable technique for palatal lengthening in cleft palate repair if accompanied by buccal flap.

KEYWORDS: cleft palate, palatal lengthening, buccal flap, velopharyngeal incompetenc

INTRODUCTION:

The goal of cleft palate repair is to close the palate with a technique that produces optimal speech and minimizes facial growth disturbances⁽¹⁾ Upon performing the palatoplasty, the palatal length following the repair is a predictor of the speech outcome⁽²⁾. An important factor to be considered in the management is the abnormal anatomy of the levator muscles, these are abnormally directed longitudinally and insert into the posterior borders of the hard palate⁽³⁾ these muscles should be mobilized, reoriented and retrotransposed across the cleft⁽⁴⁾ in order to accomplish normal palatal movement. Intraoperatively if the palate looks short, then it is reasonable to choose a palatal lengthening procedure.

Such procedures have generally been used in the primary surgery, such as those advocated by Dorrance, Wardill, Kilner and Furlow⁽⁵⁾. In 1975 Ernest Kaplan proposed a unilateral cheek flap, to be turned in for nasal lining upon incising the nasal layer as part of palatal pushback (retropositioning). This flap can either be harvested from the retro molar trigone or from the posterior alveolar buccal sulcus⁽⁶⁾. This flap is then sutured to fit the raw area in the nasal side. In this paper we present our results of retro positioning the nasal layer with or without the use of buccal flap.

PATIENTS AND METHODS:

The study was carried out on 36 patients with cleft palate in the Surgical Specialties and Al-Wasitiy teaching hospitals between January 2006 to the end of May 2008. Thorough history was taken from the patients, including previous surgeries, maternal obstetric history, family history of the same anomaly, consanguinity of the parents,

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and medical history of associated illnesses. All patients were examined, generally and complete oral examination.

Routine hematological investigations were done

METHODS:

The patients were divided into 3 groups according to nasal layer repair

Group A (control group): repaired without nasal layer lengthening technique (12 patients).

Group B: repaired with nasal layer lengthening without cover (12 patients).

Group C: repaired with nasal layer lengthening with buccal flap (8 patients).

All patients oral layers had repaired by 2 methods: Veau Wardill and Kilner technique for incomplete cleft palate and Baradach technique (figure 3 and 4) for complete clefts.

Technique:

General anesthesia was used for all patients, with neck extension.

Oral and oropharyngeal area was stained by antiseptic, and wet oropharyngeal pack was placed to protect trachea.

All patients were diagnosed to have short palate intraoperatively by stretching test.

We injected operative field by small amount of lidocaine 1% and adrenaline 1: 100000.

Mucoperiosteal flaps were elevated and based on greater palatine artery, meticulous dissection continued and separation of oral and nasal layers, muscle bulk left attached to the nasal layer. In the control group the nasal layer was closed without leaving a raw area after the repair of the muscles..

In group B and C we performed lengthening of the nasal layer by a transverse section of nasal layer 2-3 mm posterior to the junction of hard and soft palate. (Fig.1&2). This incision makes uvula touches the posterior pharyngeal wall without any stretching. Closure of nasal layer after the reorientation of the muscle was done by 4/0 polyglactin sutures. The defect resulted from lengthening of nasal layer in group B was covered only by the oral layer, while in group C it was covered by a buccal flap elevated unilaterally and inferiorly based and its size was designed to fullfit the defect on nasal layer. The flap was fixed by 4/0 polyglactin sutures to the nasal layer. Closure of buccal flap donor site was done primarily by 3/0 suture, figure (4), closure of oral layer was done by 3/0 suture. Hemostasis was accomplished by bipolar electrocautery and sometimes by absorbable haemostatic material Tongue stitch was used for all patients. Our patients were hospitalized for 2 days with systemic antibiotics for 2 days and then to continue on oral antibiotics for 5 days.

Liquid diets by spoon are allowed in the first 2 weeks and all solid food is forbidden until complete healing of flaps.

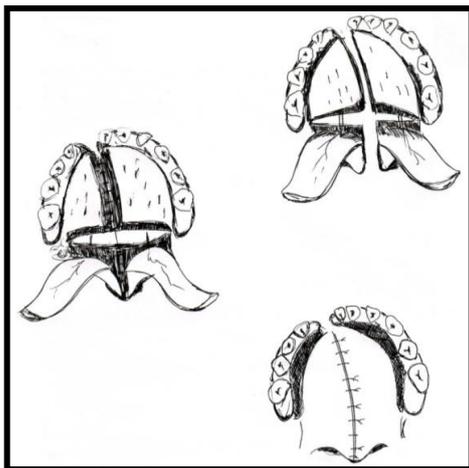


Fig.1 Transverse incision of the nasal layer. Group B.

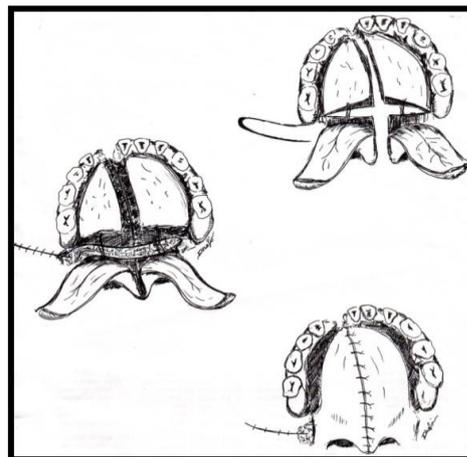


Fig.2 The buccal flap turned in . Group C.

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RESULT:

The age of the patients ranged from 12-28 months and the mean age was 18 months

The follow-up period ranged between 8-22 months. The cleft palate width ranged about 10-23 mm.

In group A (control group) :

Six of them were complete cleft palate and underwent closure by Baradach technique without lengthening of nasal layer; and the other 6 patients of group A were incomplete and closed by Veau Wardill & Kilner technique without lengthening of the nasal layer.

In group B:

Six patients were complete cleft palate and underwent closure by Baradach technique with

lengthening technique of nasal layer but without buccal flap, and 6 patients were incomplete cleft palate and closure done by Veau Wardill and Kilner technique with lengthening technique of nasal layer without buccal flap.

In group C:

Six patients were complete cleft palate and underwent closure by Baradach technique with lengthening technique of nasal layer with buccal flap.

Three patients were incomplete cleft palate and underwent closure by Veau Wardill and Kilner technique with lengthening technique of nasal layer with buccal flap, table (1).

Table (1): Distribution of patients with method of reconstruction

Group	No. of patients	Type of cleft palate	lengthening technique of nasal layer	Veau Wardil Kilner technique	Baradach technique	Buccal flap technique
A	6	Complete	-	-	+	-
	6	Incomplete	-	+	-	-
B	6	Complete	+	-	+	-
	6	Incomplete	+	+	-	-
C	6	Complete	+	-	+	+
	6	Incomplete	+	+	-	+

Two patients of group (B) developed palatal fistula (one was complete and the other was incomplete cleft palate). One patient of group B developed wound infection, tables (2&3).

Table (2): Postoperative complications

Complications	No. of patients	Group
Fistula	2	B
Infection	1	B

Table (3): Incidence of complications.

Group	No. of patients	No. of complications	%
A	12	0	-
B	12	3	25%
C	12	0	-

DISCUSSION:

All patients included in the study had short palate and were tested intraoperatively as mentioned before (Fig.3) Repair of the oral layer was by the

two common techniques; Veau Wardill-Kilner and Baradach.

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Fig.3: The stretching test done intraoperatively

In nasal layer lengthening technique we incise the nasal layer transversely just posterior to the junction between soft and hard palate. This gives excellent length to the palate and the uvula will rest on the posterior pharyngeal wall. This is the main goal of the technique. By this backward movement of the nasal layer we release the abnormal attachment of the levator palatini muscle and eventually this will transpose the muscle on the two sides of the palate and will be repaired in the center during suturing of the nasal layer. This veloplasty is of great benefits to the child to correct the abnormal anatomy, as it was postulated by Peter Randall that "abnormal position of the levator palatine muscle is the most important anatomic disorientation seen in a child with cleft palate" ⁽⁷⁾. This muscle reorientation is accomplished by posterior displacement of the soft palate muscle and consequently veloplasty during nasal layer repair is worthwhile in velopharyngeal closure ⁽⁸⁾. Levator muscle repair is one of key components to enable good speech development ⁽⁹⁾. Herbert A. Ecker stated that nasal layer lengthening technique efficiently lengthens the palate and this would make velopharynx competent *as long as keeping the palate in its new position* ⁽⁸⁾. So the important question is (would the palate keep its lengthened dimensions?). Nasal layer lengthening technique without buccal flap (group B) will leave a raw area of the nasal layer, and this may enforce scar tissue formation on the nasal layer, and consequently may not keep the palate in its new gain in length in this matter we share this fact with A C Watson that the advantage will be lost following the laws of healing ⁽¹⁰⁾ While doing the same procedure but the

raw area of the nasal layer covered by unilateral buccal flap (group C), this would make healing to be accomplished with minimal scar formation and contraction and eventually would keep the lengthened palate in its new dimensions, this technique is simple and the palate will be closed without tension. There will be no raw area on the nasal side. Also the palatal side would be closed without a raw area as might follow the use of an island flap to cover the nasal layer as in Cronin and Millard's techniques ⁽¹⁰⁾. Group (B) patients showed increased numbers of complications (25%), more than other groups, (two patients developed fistula and one patient had infection) The fistulae would need further surgery (Fig.4). These fistulae occurred at the site of incised nasal layer which will retract leaving the repair solely on the oral layer. One layer closure may explain high incidence of fistula in patient that underwent repositioning technique without buccal flap coverage, especially that the site of fistulae coincides with site of incision of nasal layer, the patient that developed Local infection, had good healing on extended course of antibiotics (Fig.5). Group (C) patients underwent relatively extended time of operation (due to dissection needed to elevate buccal flap and closure of donor site) they showed no complications, and there was no postoperative problems with the donor site of the buccal flap. But we agree with the view that these children should be followed up during the dentation period to avoid any problem of eruption of the permanent premolars under the pedicle of the buccal flap ⁽¹¹⁾

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Fig.4:Fistula site coincides with nasal layer incision.



Fig.5:local infection in the palate.

Comparing group B and C with control group A, we found that our control group gained no palatal lengthening but no fistula formation, while group B gained palatal length to a certain limit but with high incidence of palatal fistula. Group C gained palatal lengthening yet with no fistula. Further modifications of this flap using a myomucosal flap are quite encouraging in terms of fistula rate and speech outcome⁽¹²⁾ In our study we attempted at checking the accomplished lengthening in the postoperative period. During the follow up period we tried to do nasoendoscopy to check the raw area and the type of velopharyngeal incompetence. Unfortunately we failed to do that due to the technical difficulty as all our patients were young children and it was impossible to have their cooperation during the procedure. Although not accurate, but the parents of children that underwent palatal lengthening with buccal flap (group C) noticed the improvement of speech following the surgery.

CONCLUSION: This study is done on a small group of patients, yet it shows clearly that Kaplan's technique gives acceptable lengthening of the palate and muscle reorientation. The complication following this procedure are minimum as it does not leave any raw area of the nasal layer. A larger study is advisable to give more detailed results.

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